

## ABSTRACT OF THE DISCLOSURE

A system for simultaneously transmitting and receiving multiple data messages on a unidirectional ring having a plurality of nodes coupled thereto is described. This technique  
5 utilizes a medium access (MAC) protocol for a multi-gigabit-per-second local-area optical wavelength division multiplexed (WDM) network that is particularly well suited for high-performance computing environments that need a network that provides quality of service and the ability to enforce service level agreements. The protocol uses an asynchronous, unslotted, tokenless, and collision-free access scheme that is arbitrated by a centralized  
10 scheduler. The embodiment is based on a folded-bus unidirectional ring that is passively optically tapped by the nodes to both transmit data onto the network, and to receive data from the network. The system includes a scheduler based on a master/slave protocol that provisions and regulates data flow on the network, and uses a dedicated out-of-band control wavelength to broadcast scheduler directives to the nodes in the network.

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